

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to because Figure 1 is missing the description for the text box. Examiner recommends Applicant detail what components each box represents. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. Figures 2, 3A, and 3B should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled

"Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-3 and 6-7, 9, 16-20, 22 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Shimazaki et al. 6,122,228.

Regarding claim 1, Shimazaki et al. a method of controlling a read-out operation from a magneto-optical recording medium (90 of Fig. 9), said recording medium comprising a storage layer and a read-out layer (Fig. 12A), wherein a domain is expanded in said read-out layer by copying a mark region from said storage layer to said read-out layer upon heating by a radiation beam having a radiation power and with the help of an external magnetic field, said method comprising the steps of: modulating said external magnetic field to control the expansion of said domain during an expansion period and to control the collapse of said domain during a collapse period (3 Magnification and 4 Extinguishment of Fig. 12A) and increasing said radiation power during at least part of said collapse period of said external magnetic field to a first level,

said first level being higher than a second level applied during said expansion period of said external magnetic field (Pr1 and Pr2 of Fig. 12B, Col 9 Lines 45-58).

Regarding claim 2, Shimazaki et al. teach a method according to claim 1, wherein said increasing of said radiation power is obtained by adding an additional radiation pulse during said part of said collapse period (Col 20 Lines 27-48).

Regarding claim 3, Shimazaki et al. teach a method according to claim 2, wherein said increasing of said radiation power is obtained by adding said additional radiation pulse immediately after an expansion radiation pulse of said second level (Fig. 7, Col 20 Lines 41-45).

Regarding claim 6, Shimazaki et al. teach a method according to claim 2, wherein said radiation power is decreased with respect to said second level for a predetermined time period immediately after said additional radiation pulse (Fig. 7, Col 20 Lines 41-45).

Regarding claim 7, Shimazaki et al. teach a method according to claim 1, wherein said external magnetic field is reduced to a stabilizing level after the expansion of said domain (3 Magnification and 4 Extinguishment of Fig. 12A, Col 9 Lines 25-44).

Regarding claim 9, Shimazaki et al. teach a method according to claim 1, wherein the timing of the application of said first level is selected such that the thermal decay from a predetermined collapse temperature starts just before the beginning of said expansion period of said external magnetic field (Fig. 11).

Regarding claim 16, Shimazaki et al. teach a method according to claim 1, wherein said increasing of said radiation power is performed such that the temperature

of said read-out layer during said collapse period is higher than or equal to the temperature of said read-out layer during said expansion period (Fig. 11).

Regarding claim 17, the limitations have been analyzed and rejected with respect to the reasons given above as set forth in claim 1.

Regarding claim 18, Shimazaki et al. teach an apparatus according to claim 17, wherein said reading apparatus is a disk player for MAMMOS disks (Col 5 Lines 10-30).

Regarding claim 19, the limitations have been analyzed and rejected with respect to the reasons given above as set forth in claim 3.

Regarding claim 20, the limitations have been analyzed and rejected with respect to the reasons given above as set forth in claim 7.

Regarding claim 22, the limitations have been analyzed and rejected with respect to the reasons given above as set forth in claim 9.

Regarding claim 24, the limitations have been analyzed and rejected with respect to the reasons given above as set forth in claim 16.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 4-5, 8 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimazaki et al. US 6,671,233 B1 as applied in claim 1 above, and further in view of Awano et al. US 2002/0018404 A1.

Regarding claims 4 and 5, Shimazaki et al. does not teach a method according to claim 2, wherein the duty cycle of said additional pulse is greater than 70% or about 100%.

However, Awano et al. teach the duty cycle to be within a range of 15% to 90% ([0160]-[0161]). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of the method of reproduction a magnetic optical recording medium as taught by Shimazaki et al. with the duty of the reproduction pulse to be within a range of 71% to 90% as taught by Awano et al. as a whole for the following reason: one of ordinary skill in the art would have combined the teachings of the method of reproduction a magnetic optical recording medium as taught by Shimazaki et al. with the duty of the reproduction field to be within a range of 71% to 90% as taught by Awano et al. for the benefit of enhancing the reproduced signal (Shimazaki et al. Col 21 Lines 7-10).

Regarding claim 8, Simazaki et al. does not teach a method wherein a first radiation pulse is applied during said expansion period and a second radiation pulse is applied during said collapse period, said first radiation pulse being shorter than said second radiation pulse.

However, Awano et al. teach the adjustment of the pulsed laser beam to maintain the magnetic domain of the magnification process to be shorter than the erasure

process (Fig. 28A [0169]-[0175]). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of the method of reproducing a magnetic optical recording medium as taught by Shimazaki et al. with the time required for the magnify and erase process as taught by Awano et al. as a whole for the following reason: one of ordinary skill in the art would have combined the teachings of the method of reproducing a magnetic optical recording medium as taught by Shimazaki et al. with the time required for the magnify and erase process as taught by Awano et al. for the benefit of faster prevention of magnetic influence on the other domains.

Regarding claim 21, the limitations have been analyzed and rejected with respect to the reasons given above as set forth in claim 8.

7. Claims 10 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimazaki et al. US 6,671,233 B1 as applied in claim 1 above, and further in view of Nakao et al. 5,283,770.

Regarding claim 10, Shimazaki et al. fail to teach a method wherein the radiation spot size selected during the application of said first level of radiation power differs from the radiation spot size selected during the application of said second level of radiation power.

However, Nakao et al. teach a reproduction beam having two different spot sizes (Fig. 4, Col 7 Lines 1-16). Therefore, it would have been obvious to one of ordinary skill in the art would to combine the teachings of the method of reproduction a magnetic optical recording medium as taught by Shimazaki et al. with the two different laser spot sizes as taught by Nakao et al. as a whole for the following reason: one of ordinary skill

in the art would have combined the teachings of the method of reproduction a magnetic optical recording medium as taught by Shimazaki et al. with the two different laser spot sizes as taught by Nakao et al. for the benefit of reading a super resolution pit on the magnetic disc.

Regarding claim 23, the limitations have been analyzed and rejected with respect to the reasons given above as set forth in claim 10.

8. Claims 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimazaki et al. US 6,671,233 B1 as applied in claim 2 above, and further in view of Applicant's Admitted Prior Art (WO 2004/032133, PCT/IB2003/003944).

Regarding claims 13 and 14, Shimazaki et al. fail to teach a method wherein an asymmetrical duty cycle switching is used for applying said external magnetic field, while the timing of said additional pulse relative to the switching of said external magnetic field corresponds to a symmetrical switching and wherein said additional pulse is applied only after a mark detection.

However, Applicant's admitted prior art describes a method of driving the magnetic field using a data dependent field switching technique (Page 2, Line 11-21, the duty cycle is asymmetrical due to the direction of expansion to be constant until a field is read out and will switch when a peak is detected). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of the magnetic read-out operation as taught by Shimazaki et al. with the method of data-dependent field switching as taught by AAPA as a whole for the following reason: one of ordinary skill in the art would have combined the teachings of the magnetic read-out operation as taught

by Shimazaki et al. with the method of data-dependent field switching as taught by AAPA for the benefit of storage density (Page 2 Lines 20-21).

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimazaki et al. US 6,671,233 B1 and Applicant's Admitted Prior Art (WO 2004/032133, PCT/IB2003/003944) as applied in claim 14 above, and further in view of Nakao et al. 5,283,770 for the reasons set forth above with respect to claim 10.

***Allowable Subject Matter***

9. Claims 11 and 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kezhen Shen whose telephone number is (571) 270-1815. The examiner can normally be reached on Monday - Friday 10:00 am to 6:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Korzuch can be reached on (571) 272-7589. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kezhen Shen/  
Examiner, Art Unit 2627

/William Korzuch/  
SPE, Art Unit 2627